DESIGN OF NANOCARRIERS TO REDUCE SYSTEMIC TOXICITY OF ANTITUMOR AGENTS: DOXORUBICIN CASE STUDY

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The application of nanoparticles (NPs) has enormous potential for increasing the efficiency of drug and gene delivery, while decreasing the unwanted toxic effects, especially in developing antitumor drugs [1,2]. One of the very effective agent against a wide range of malignancies is doxorubicin (DOX) that is also characterized by low selectivity leading to severe side effects, like cardiotoxicity that limit its long-term use and prevents optimal benefits for the patient [3]. This study evaluated the metabolic alterations in liver, kidney and heart of animals induced by innovative DOX nanoformulation compared to conventional and liposomal formulation that are already in clinical use. Imaging mass spectrometry (IMS) was used to simultaneously record the intensities of numerous m/z signals that correspond to different metabolites' contents in tissue sections. Metabolites and pathways associated with the administration of different DOX pharmaceutical formulations were compared to the metabolic alterations described in the literature. Obtained results indicated the value of nanotechnology to open up opportunities for the development of safe and efficient drug nanoformulations.

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